THE KEY ROLE OF SNIa AT DIFFERENT METALLICITIES FOR GALACTIC CHEMICAL EVOLUTION OF p-NUCLEI

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The bulk of p-isotopes is created in the 'gamma processes', mainly by sequences of photodisintegrations and beta decays in explosive conditions in core collapse supernovae or in Type Ia supernovae (SNIa).
We explore single degenerate SNIa in the framework of 2D delayed detonation explosion models.
We present a detailed study of p-process nucleosynthesis occuring in SNIa with s-process seeds at different metallicities. Based on the delayed detonation model (DDT-a) of Travaglio et al. (2011), we analyze the dependence of p-nucleosynthesis to s-seed distributions obtained with different amounts of the ^{13}C and at different metallicities. Selecting heavy-s seeds ($140 < A < 208$) alone, while keeping both ^{208}Pb and light-s seeds as scaled solar, we find contribution of about 30-40% to the total light-p nuclei production up to 132Ba (exceptions are ^{94}Mo and ^{130}Ba, for which the heavy-s seeds contribute by about 15%). Using a Galactic chemical evolution code (see Travaglio et al. 2004) we give estimates of the contribution of SNIa to the solar p-process composition, including the radiogenic ^{92}Nb, ^{146}Sm, and ^{97,98}Tc. Uncertainties in nuclear physics will also be discussed. First reults for 3D SNIa (Seitenzahl et al. 2013) p-process calculations will be presented, with comparison with 2D calculations. Assuming that about 70% of normal SNe Ia are due to the progenitor and explosive mechanism considered here, we find that SNe Ia can be responsible for at least 50% of the p-nuclei abundances in the Solar System.

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[2]C. Travaglio, et al. 2004, ApJ, 601, 864
[3]I.R. Seitenzahl et al. 2013, MNRAS, 429, 1156